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**Commons et al.**(10) **Pub. No.: US 2005/0100312 A1**(43) **Pub. Date: May 12, 2005**(54) **METHOD AND APPARATUS FOR  
REMOTELY CONTROLLING A RECEIVER  
ACCORDING TO CONTENT AND USER  
SELECTION****Related U.S. Application Data**

(60) Provisional application No. 60/500,582, filed on Sep. 4, 2003.

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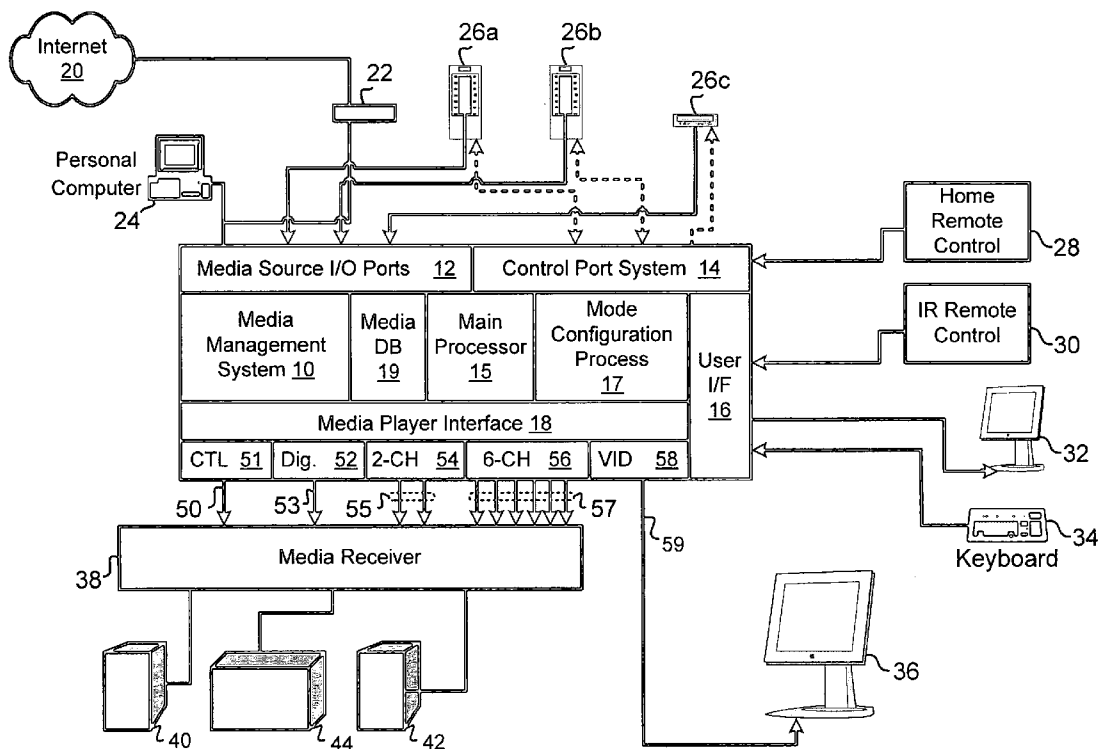
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**ABSTRACT**

System and method for automatically controlling a media receiver by instructing the media receiver to use a particular receiver connection and to play a selected media unit using one of a plurality of play modes according to characteristics of the media unit. Media units may be encoded using any of a variety of encoding formats. The media management system may interface with a media receiver to select media receiver connections in accordance with the media type of the media unit. The media management system may also interface with the media receiver to set media receiver settings for playing the selected media unit according to the media receiver settings selected for a play mode corresponding to the characteristics of the selected media unit.

(73) Assignee: **Digital Networks North America, Inc.**, Santa Clara, CA (US)(21) Appl. No.: **10/935,068**(22) Filed: **Sep. 7, 2004**

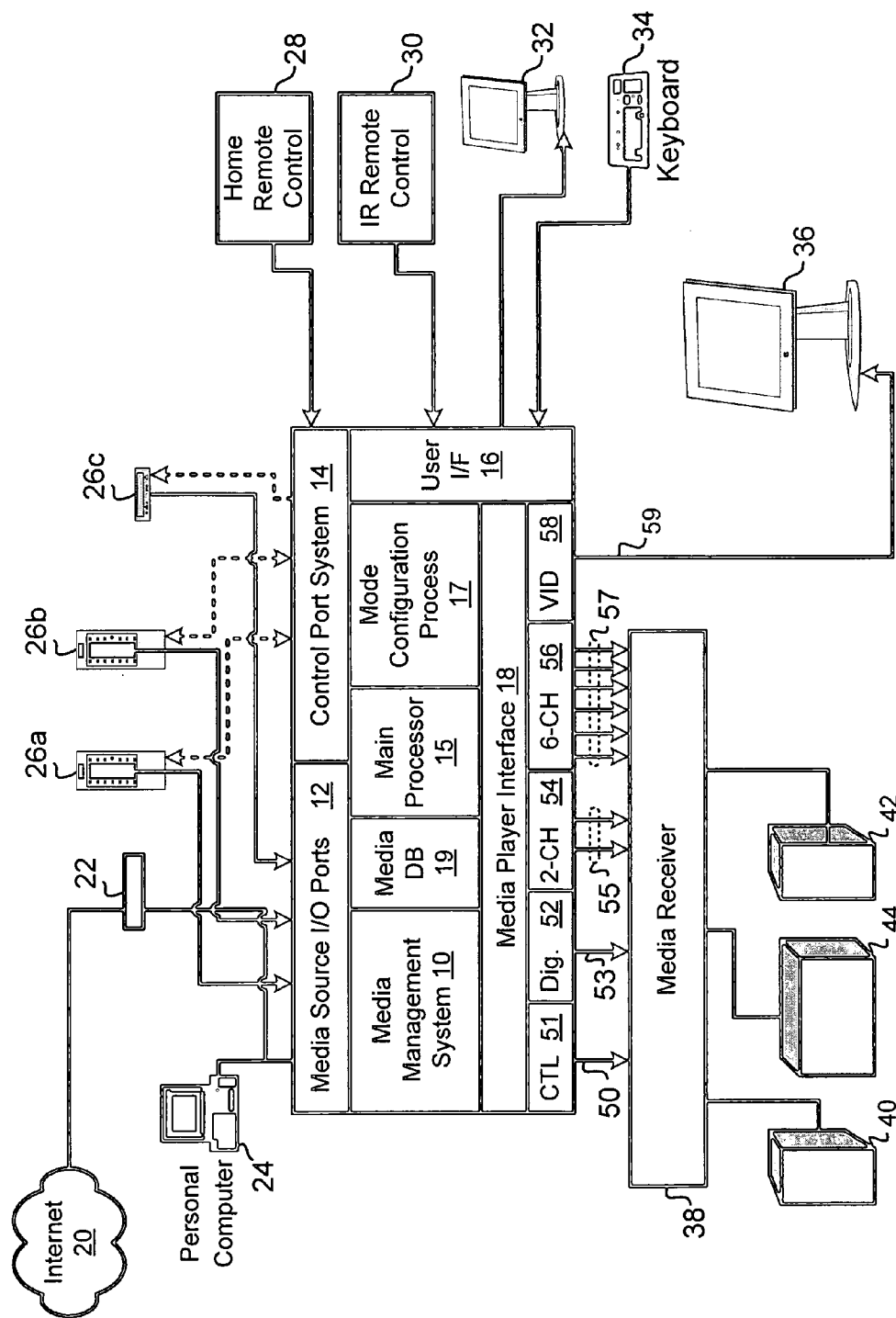


Figure 1

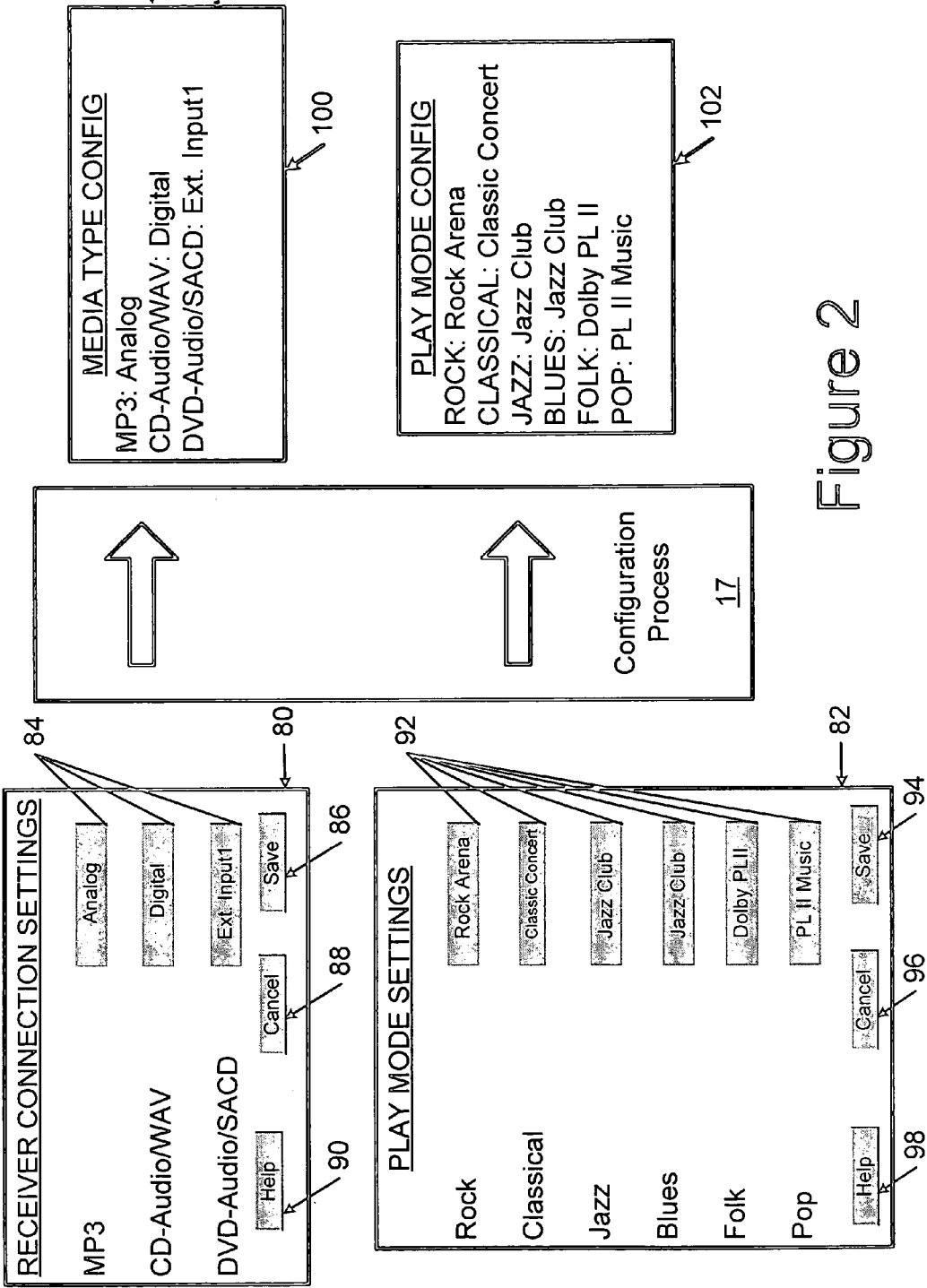


Figure 2

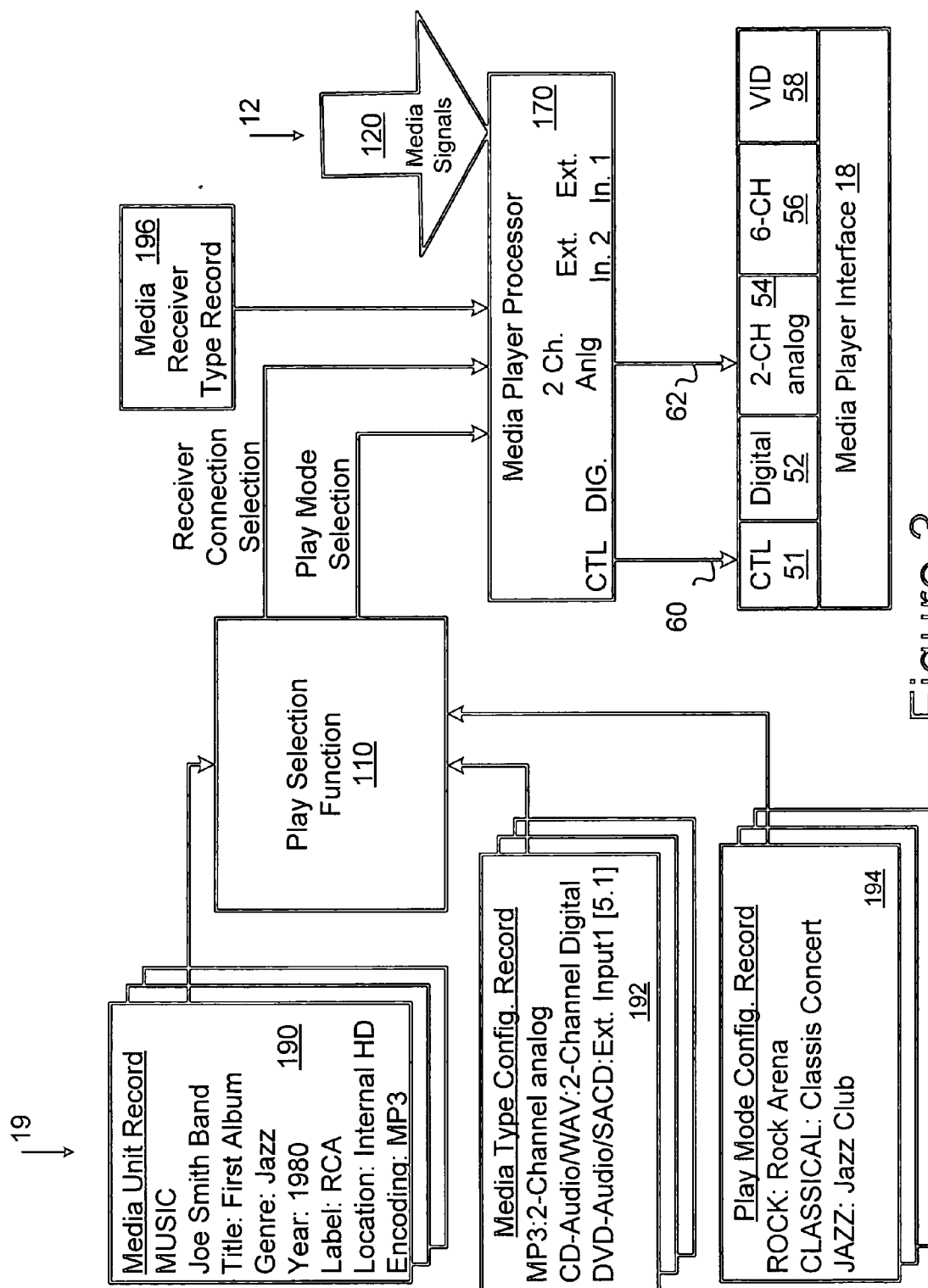


Figure 3

# METHOD AND APPARATUS FOR REMOTELY CONTROLLING A RECEIVER ACCORDING TO CONTENT AND USER SELECTION

## CROSS REFERENCE TO RELATED APPLICATION

[0001] This application claims the benefit of U.S. Provisional Application No. 60/500,582, filed on Sep. 4, 2003, entitled "Method and Apparatus for Remotely Controlling a Receiver according to Content and User Selection," which is incorporated herein by reference.

## FIELD OF INVENTION

[0002] The current invention relates to entertainment devices and, more specifically, to systems and methods for automatic control over peripheral equipment connected to media management systems.

## BACKGROUND

[0003] Media management systems are becoming increasingly popular among consumers of entertainment media who need assistance in managing their ever-growing collections of CD's, DVD's, MP3 files and media-playing equipment. Media management systems interface with a variety of sources of media. For example, a media management system may receive media from different CD-changers, different DVD-changers, the Internet, a CD player, a DVD player, a personal computer and a hard disk drive. Media management systems also interface with a variety of media players. For example, the same media management system may play media on a monitor, a television, and on different audio receivers. Media management systems are also typically able to display information about the media available on the connected sources of media on a user interface. The user interface allows the user to communicate instructions to play selected pieces of media.

[0004] Developers of media management systems aim to interface with as wide a variety of media sources as possible. Different media sources make media available in forms that provide different capabilities for enhancing the user experience. Web-sites on the Internet offer users the convenience of downloading music or other audio as MP3 files. Video works and music are now available on different types of discs such as DVD, CD, Super-Audio CD (SACD), WAV, MP3, DVD-Audio, etc. offering the user options such as choices in surround modes available to the user. In this regard, audio/video receivers now have a variety of inputs to allow a user to connect alternative media sources. A user may connect media sources, audio receivers and video players to a media management system to take advantage of the many options available to experience the media.

[0005] Providing such variety of capabilities imposes on the user the burden of learning and understanding the capabilities available on the user's media management system. Moreover, the user typically manually configures the manner in which a selected piece of media will be played each time it is played. For example, a user may direct an SACD disc to a 6-channel analog input on the receiver when playing an SACD disc. Then, if the user wishes to listen to an MP3 file, the user may manually configure the media management system to direct the output to a 2-channel input

on the receiver. Such manual configuration for each type of media source becomes burdensome to the user.

[0006] Based on the foregoing, a need exists for automatically configuring receivers to play media using sound and video modes according to characteristics of the media.

## BRIEF DESCRIPTION OF THE DRAWINGS

[0007] The subject matter regarded as the invention is particularly pointed out and distinctly claimed in the concluding portion of the specification. The invention, however, both as to organization and method of operation, together with features and advantages thereof, may best be understood by reference to the following detailed description when read with the accompanying drawings in which:

[0008] **FIG. 1** is a block diagram illustrating an exemplary media management system;

[0009] **FIG. 2** is a block diagram illustrating an exemplary configuration process; and

[0010] **FIG. 3** is a block diagram illustrating an exemplary system and method for playing media in accordance with a user configuration.

## DETAILED DESCRIPTION

[0011] In the following detailed description, numerous specific details are set forth in order to provide a thorough understanding of the invention. However, it will be understood that the present invention may be practiced without these specific details. In other instances, well-known methods, procedures, components and circuits have not been described in detail, so as not to obscure the present invention.

[0012] 1. Overview

[0013] **FIG. 1** is a block diagram of an exemplary media management system **10** that includes:

[0014] (i) a plurality of media source input/output (I/O) ports **12**, (ii) a control port system **14**, (iii) a main processor **15**, (iv) a user interface **16**, (v) a mode configuration process **17**, (vi) a media player interface **18**, (vii) a media database **19**, (viii) a control signal connection **51**, (ix) a digital connection **52**, (x) a 2-channel audio connection **54**, (xi) a 6-channel audio connection **56**, and (xii) a video connection **58**.

[0015] The control signal connection **51**, the digital connection **52**, the 2-channel analog connection **54**, the 6-channel analog connection **56**, and the video connection **58** are communicatively coupled to a media receiver **38**. The media receiver **38** may be configured in various arrangements. For example, the media receiver **38** may comprise a pre-amplifier. As another example, the media receiver **38** may include a pre-amplifier and a decoder that decodes media for playing the media in one of a variety of play modes. As yet another example, the media receiver **38** may comprise a pre-amplifier and an amplifier. As still yet another example, the media receiver **38** may include a pre-amplifier, an amplifier, and a radio frequency tuner. Other examples of media receiver arrangements are also possible.

[0016] The main processor **15** could comprise one or more processors, such as a general purpose processor and/or a

digital signal processor. The main processor **15** executes program instructions in order to work cooperatively with the plurality of media source I/O ports **12**, the control port system **14**, the user interface **16**, the mode configuration process **17**, and the media player interface **18**.

[0017] The plurality of media source I/O ports **12** are coupled to a plurality of media source devices or systems. By way of example, the plurality of devices or systems may include the Internet **20**, a personal computer **24**, a first disc changer **26a**, a second disc changer **26b**, and a third disc changer **26c**. Other examples of the devices or systems coupled to the plurality of media source I/O ports **12** are also possible.

[0018] The Internet **20** is preferably connected to a network hub **22**, which provides Internet access to the personal computer **24** in a local area network environment. The personal computer **24** may connect to the media management system **10** using any suitable data connection (e.g. RS232, Ethernet, wireless Ethernet, etc.). In a preferred embodiment, the personal computer **24** connects to the media management system **10** at an Ethernet connection over which the media management system **10** connects to the Internet **20**.

[0019] The first, second and third disc changers **26a-c** may be any disc changer operable to hold a plurality of media discs such as audio CDs (compact discs), Super Audio CD's (SACD), and DVD's (digital versatile disc or digital video disc). The disc changers **26a-c** connect to the media management system **10** at the media source I/O ports **12** to communicate media to the media management system **10**.

[0020] The media management system **10** may include a control port system **14** for controlling the disc changers **26a-c**. The control port system **14** may provide control signals to disc changers **26a-c** via infrared (IR) (e.g. wired IR or wireless IR), or serial connections (e.g. two-way serial or S-Link based connections). Other examples of control signal types provided by the control port system **14** to the disc changers **26a-c** are also possible.

[0021] The control port system **14** may interface (e.g. via an RS-232 serial cable) with a home remote control system **28**. As an example, the home remote control system **28** may provide control for the media management system **10**, as well as control for other systems, such as appliances and/or a furnace in a home.

[0022] The media management system **10** accesses each of the plurality of media sources and organizes information about the media that is accessible to the user of the media management system **10** in the media database **19**. The media database **19** may be any type of storage system. For example, the media database **19** may comprise a disc-based mass storage device, a flash memory system, or a combination of flash memory and disc-based memory. The media database **19** stores media unit records, i.e., records containing information about media units that may be received from the media sources. As used herein, the term media unit shall refer to any playable or renderable piece of media, such as a song, a movie, a picture, a track on a disc, a portion of audio/visual programming, or any other audio and/or video segment.

[0023] In exemplary embodiments, a media unit record contains information in the form of characteristics such as a

title (e.g. a CD title, a DVD title, or a movie title), a song, a genre, a location, an artist, a date, and/or a media type. The location defines the location of the media unit on the media source. For example, a media unit record for a song may denote that the song is located in a particular slot on a particular tray in a particular one of the CD changers that may be connected as a media source to the media management system **10**. As another example, a media unit record for a song may denote that the song is located as a particular track on a disc, such as a CD, DVD, and/or SACD. An artist defines a performer's work or group of performers' work recorded as a media unit. A date, for example, may define the day which a media unit was recorded or a day the media unit was released by a recording studio. Other examples of the date are also possible.

[0024] The media type defines the format used to encode a media unit. Various media types are available for encoding audio. For example, a media type may include the Motion Picture Experts Group—audio layer **3** (MP3) format, a CD format, a SACD format, a DVD format, a waveform audio (WAV) format, pulse code modulation (PCM) format, free lossless audio code (FLAC) format, or an advance audio coding (AAC) format. The media type may also define whether the media unit is encoded as (i) encrypted or unencrypted media, or (ii) compressed or uncompressed media. Other examples of formats for digitally encoding audio are also possible.

[0025] Further, a media type format may have a variety of encoding characteristics. For example, an audio recording may be encoded as an MP3 file in mono format having a data rate of 96K bits per second (bps), or as an MP3 file in stereo format having a data rate of 96K bps, or as an MP3 file in stereo format having a data rate of 192K bps. As another example, the AAC format could be encoded using a variable bit rate or a constant bit rate and with a different amount of audio channels, (e.g. 1 channel, 2 channels, etc.). Other examples of encoding characteristics of the MP3 format, the AAC format, or other media type are also possible.

[0026] The media management system **10** may display selected information about the media from the media unit records stored in the media database **19** on a display **32**. The media management system **10** may also allow the user to configure and select media to play using a keyboard **34**, an IR remote control **30** or another suitable input device. The media management system **10** may include a user interface **16** that processes user input and output via the display **32** and the keyboard **34** and provides configuration and execution processes to allow the user to manage and play the media obtained from the media sources. As an example, the display **32** may comprise a touch-screen that allows a user to (i) configure and select media, and (ii) select play modes, by touching the touch-screen while a configuration and selection screen is shown on the display **32**.

[0027] In a preferred embodiment, the user interface **16** may be coupled to a configuration process **17** that allows the user to configure the media receiver **38** to play the media in accordance with requirements specified in a play mode. The configuration process **17** may display screens to query the user prompting the user to enter information about play modes for the particular media types available.

[0028] As an example, the user may specify that a song in an MP3 format will be played on a receiver via a 2-channel

analog connection. In this regard, for 2-channel analog, the media management system **10** processes the MP3 song by extracting the left and right channel analog signals of the MP3 song and then sends the left and right analog signals **55** to a corresponding 2-channel analog connection at the media receiver **38**. The media receiver **38** may process the left and right channel signals **55** by amplifying the signals before outputting the signals to a left speaker and a right speaker respectively.

[0029] As another example, the MP3 song may also be communicated digitally (in MP3 or other digital format) to another digital player. In this regard, the user may specify a receiver connection that sends a digital signal **53** from the digital connection **52** to a corresponding digital connection at the media receiver **38**. As yet another example, the user may specify a receiver connection that sends 6-channel audio signals **57** from the 6-channel audio connection **56** to a corresponding 6-channel audio connection at the media receiver **38**.

[0030] The 2-channel analog receiver connection is only one of many media receiver connections that may be specified for a given media type. Other examples of media receiver connections include: (i) 5.1 analog connections, and (ii) digital connections, such as a 2-channel digital connection, a 5-channel digital connection, or a 7-channel digital connections. Other examples of media receiver connections are also possible. These media receiver connections may correspond directly to the connections available on the media receiver **38**. FIG. 1 shows a digital connection **52**, a 2-channel analog connection **54**, and a 6-channel audio connection (e.g. for use with 5.1 modes) **56**.

[0031] Audio signals received at the media receiver **38** may be played through one or more speakers coupled to the media receiver. As an example, the media receiver **38** is shown connected to a first speaker **40** (e.g. a speaker for a left-audio channel), a second speaker **42** (e.g. a right-channel speaker), and a third speaker **44** (e.g. a speaker for a center-audio channel). Other examples of the amount of speakers coupled to the media receiver **38** and/or the audio signal played through a particular speaker are also possible.

[0032] The media receiver **38** may also drive video equipment, such as a television or monitor **36** via a video connection **58**. In this regard, a video signal **59** is sent to the television or monitor **36**. The video formats may include compressed media (video and/or audio content), uncompressed media, or a combination of compressed and uncompressed media. Examples of video formats include: (i) Motion Picture Experts Group (MPEG)-1, (ii) MPEG-2, (iii) MPEG-4, (iv) high definition television (HDTV), (v) National Television System Committee (NTSC), (vi) Phase Alternating Line (PAL), (vii) Joint Photographic Experts Group (JPEG), and (viii) Video-CD. Other examples of video formats are also possible.

[0033] The media receiver **38** may also use play modes specific for different video formats as well. For example, a Denon receiver may be commanded to configure the receiver according to special play modes that the receiver is designed to understand. The media management system **10** may send commands specifying play modes, such as (i) Digital Theater System (DTS) (e.g. DTS-ES, DTS-Neo:6, DTS-Digital Surround, or DTS-96/24), (ii) Dolby Pro Logic (DPL) (e.g. DPL II, DPL Movie, or DPL Music), (iii) Dolby

Digital (e.g. Dolby Digital EX) (iv) THX (e.g. THX Cinema), (v) Wide Screen, (vi) Super Stadium, (vii) Rock Arena, (viii) Jazz Club, (ix) Classic Concert, (x) Mono Movie, (xi) Matrix, (xii) 5-Channel Stereo, (xiii) 7-Channel Stereo, (xiv) Stereo, (xv) Pure Direct, or (xvi) Direct.

[0034] These play modes (and others that may be defined) may be used with media receivers (e.g. media receiver **38**) that are able to interpret these play modes and configure characteristics about the receiver to play the media. Configurable characteristics include equalization (e.g. equalizer settings), level adjustments (e.g. input level, or speaker level), delay time, noise reduction, bass setting, and a balance setting. Other examples of configurable characteristics are also possible.

[0035] In a preferred embodiment, the media management system **10** couples a control signal **50** to the media receiver **38** to communicate configuration instructions for playing a particular media unit. The control signal **50** may communicate commands to configure the receiver **38**. The commands may be specific to the type (brand or make) of receiver based on the receiver's command set. For example, the media receiver **38** may be a Denon or Marantz receiver that may be controlled by the control signal **50**. Examples of Denon receivers that may be controlled by the control signal **50** include:

[0036] AVR-2803

[0037] AVR-3803

[0038] AVR-4802R

[0039] AVR-5803

[0040] Examples of Marantz receivers that may be controlled by the control signal **50** include:

[0041] SR7300

[0042] SR7300se

[0043] SR8200

[0044] SR8300

[0045] SR9300

[0046] These Denon and Marantz receivers are controlled using an RS232 connection for the control signal **50**. However, other receivers and other types of control connections may be used as well.

[0047] In exemplary embodiments, the media management system **10** configures the media receiver **38** to play media using a selected receiver connection. The selected receiver connection is used to configure the receiver **38** by ensuring that the media is communicated on the receiver connections that correspond to the media type (e.g. encoding format such as MP3, SACD, DVD-Audio, FLAC, AAC, etc.). In exemplary embodiments, the user is provided with the configuration process **17** to configure how media will be played automatically as a function of its media type and/or genre, artist, or any other suitable characteristic that may be included in the media unit record.

[0048] 2. An Exemplary Configuration Process

[0049] FIG. 2 depicts operation of an exemplary configuration process **17** that may be used in the media management system **10** shown in FIG. 1. The configuration process **17** is

preferably invoked during a setup stage during which the user configures the media management system **10** for operation. During the setup stage, the user may connect all of the necessary equipment to the media management system **10** and go through various interactive stages of inputting information to enable the media management system **10** to perform its functions. For example, one interactive stage may entail setting up service with an Internet Service Provider to be able to communicate with a web-site that provides media to download.

[0050] In the configuration process **17** in FIG. 2, the user may enter a receiver configuration stage involving a receiver connection setting screen **80** and a play mode setting screen **82**. Referring to the receiver connection setting screen **80**, the user may select receiver connections from drop-down menus **84** for each media type listed. The user may then save the selections to a media type configuration record **100** by clicking on a 'SAVE' button **86**. The user may click a 'Cancel' button **88** to start again, or a 'Help' button **90** to get interactive help services. The user may also select play modes from drop-down menus **92** on the play mode setting screen **82**. As an example, the play modes may be correlated with a particular genre (or another one of the plurality of characteristics) of the media units available for play by the media receiver **38**. The user may save play mode selections to a play mode record **102** by clicking on the 'SAVE' button **94**.

[0051] Those of ordinary skill in the art will appreciate that the receiver connection setting screen **80** and the play mode setting screen **82** are shown as examples of configuration screens that a user may use to select how the media receiver **38** will be automatically configured to play a selected media unit. The play mode setting screen **82** may use other characteristics, such as artist, title, or location, to select the play that will be used by the media receiver **38** when playing the selected media unit. Other examples of the receiver connection setting screen **80** and/or the play mode setting screen **82** are also possible.

### [0052] 3. An Exemplary System and Method for Playing Media

[0053] FIG. 3 depicts operation of a system in the media management system **10** for automatically selecting a play mode and a receiver connection for configuration of the media receiver **38**. Various events and/or timing may be used to trigger the automatic selection of a play mode and receiver connection. For example, the automatic selection may occur in response to installing a disc into a disc player, such as the first CD changer **26a**, shown in FIG. 1. As another example the automatic selection may occur in response to receiving a stream of media from a data storage device. In this regard, the data storage device could be local to the media management system **10** or remote from the media management system, such as at a data storage device at the personal computer **24** or on the Internet **20**. Other examples of triggering the automatic selection of a play mode and receiver connection are also possible.

[0054] As shown in FIG. 3, the system comprises a media player interface **18**, a play selection function **110**, a media play processor **170**, a media unit record **190**, a media type configuration record **192**, a play mode record **194**, and a media receiver type record **196**. The media unit record **190**, the media type configuration record **192**, the play mode

record **194**, and the media receiver type record **196** may be stored in the media database **19** (shown in FIG. 1). Further, the system may comprise a plurality of media unit records, each corresponding to a particular media unit. Further still, the system may include a plurality of media type configuration records, play mode records, and media receiver type records, such as to accommodate the preferences of more than one user of the system.

[0055] The play selection function **110** may retrieve one or more records from the media data base **19**. For example, the play selection function **110** retrieves a media unit record **190** from the media database **19** for a selected media unit. The media unit may be selected directly when the user selects the media unit from the user interface. The media unit may also be selected as part of a playlist that contains the name of the media unit and retrieves the information while processing the songs on the playlist. The playlist may be user defined or pre-defined in an album or other type of collection of media units.

[0056] The media unit record **190** contains information about the media unit that has been selected for play. As an example, the media unit record **190** may include information that identifies (i) a media unit as an audio (music) or a video media unit, (ii) an artist name, such as "Joe Smith" (iii) a title, such as "Joe Smith's First Album" (iv) a genre, (v) a date, such as a recording date, (vi) a label, such as Radio Corporation of America (RCA), (vii) a location, such as an internal hard drive in a personal computer, and (viii) a media type, such as MP3. Other examples of information in a media unit record **190** are also possible.

[0057] As another example, the play selection function **110** may also retrieve a media type configuration record **192**, which may be configured as described above with reference to the media type configuration record **100** in FIG. 2. The play selection function **110** determines the media type for the selected media unit from the media unit record **190**. In the example shown in FIG. 3, the media type is MP3. The play selection function **110** then determines a receiver connection selection for the selected media type by reference to the media type record **192**.

[0058] For instance, the receiver connection shown in the media type configuration record **192** for MP3 is 2-Channel Analog. As additional examples, if the media type is CD-audio or a WAV file, then the receiver connection is 2-channel digital, or if the media type is DVD-audio or SACD, then the receiver connection is the analog 5.1 connection. Other examples of receiver connections identified in the media type configuration record **192** are also possible.

[0059] As another example, the play selection function **110** may retrieve a play mode record **194**. The play mode record **194** includes play modes that correspond to a genre characteristic of a media unit. As an example, a play mode "rock arena" corresponds to a rock genre, a play mode "classic concert" corresponds to a classical genre, and a play mode "jazz club" corresponds to a jazz genre. As another example, a user may select a play mode "rock arena" for a jazz genre. Other examples of play modes corresponding to a characteristic of a media unit are also possible.

[0060] The play selection function **110** determines a play mode selection based on the media unit record **190** and the play mode record **194**. For instance, since the genre char-



acteristic of the media unit record **190** is Jazz and the play mode for the Jazz genre is Jazz Club (as defined by the play mode record **194**), the play selection function **110** determines the play mode selection as being Jazz Club.

[0061] The play selection function **110** interfaces to a media play processor **170** to communicate the play mode selection and the receiver connection selection for a selected media unit. The media play processor **170** receives the play mode selection, the receiver connection selection, as well as a media receiver type record **196**. The media receiver type record **196** identifies the type of receiver coupled to a media management system. For example, the media receiver type record **196** may identify a receiver as being a Denon brand receiver having a model number of AVR-2803.

[0062] The media play processor **170** receives the media signals **120** of the selected media unit from the media source I/O ports **12** shown in FIG. 1. The media play processor **170** uses the receiver connection selection and the media receiver type record to determine the selected receiver connection and to couple the media signals **120** to the selected receiver connections at the media player interface **18**. The media play processor **170** uses the play mode selection, the receiver connection selection, and the media receiver type record to determine which instructions to send the media receiver **38** for configuration of the media receiver **38**.

[0063] In one exemplary embodiment, the media play processor **170** communicates a control signal **60** to the control signal connection **51**, for transmission in turn to the media receiver **38**. The control signal **60** communicates a control instruction to the media receiver **38** that instructs the media receiver **38** to use a particular receiver connection and one of a plurality of play modes in accordance with the instruction. For example, the media play processor **170** may

request that the media receiver **38** use a play mode called "Rock Arena." The media receiver **38** would be capable of using various specific settings of characteristics such as tone, equalizer settings, noise reduction, delay time, bass setting, balance setting, and level adjustments to output sound in a manner that may be characterized as sounding like "Rock Arena." The media receiver **38** would also be compatible with the control instruction it receives.

[0064] As another example, the media play processor **170** may request that the media receiver **38** switch an input source for media signals to a particular receiver connection. In this regard, the media play processor **170** requests the media receiver **38** to use receiver connections of the media receiver that are coupled to receiver connections at the media player interface **18**. For example, the media play processor **170** may request the media receiver to use a 2-channel analog receiver connection that is coupled to the 2-channel analog connection **54**. In this regard, the media play processor **170** will route the media signals **120** to the 2-channel analog connection **54** as 2-channel analog signals **62**, for transmission in turn to the 2-channel analog receiver connection at the media receiver **38**. Other signals that may be sent by the media play processor **170** are signals sent to the digital connection **52**, the 6-channel analog connection **56**, or the video connection **58**. These signals are not shown for clarity of the example above.

[0065] Specific media receivers are already capable of such functionality. Tables 1-10 contain categories of control instructions and other information that may be communicated to the media receiver **38** on a control signal **50** to configure the media receiver **38**. The control instructions in Tables 1-10 are for a Denon AVR-SR9200. Those of ordinary skill in the art will appreciate that Tables 1-10 shows just one example of the types of control instructions that may be defined for other media receivers.

TABLE 1

Normal Command List				
Command		Priority	(Sample Command ID = 1) Character Sample	
Power	Power	LOW	A0	"@1A0",0x0D
	Power ON	HIGH	A1	
INPUT	Power OFF	HIGH	A2	
	DSS	HIGH	B0	
	TV	HIGH	B1	
	LD	HIGH	B2	
	DVD	HIGH	B3	
	VCR1	HIGH	B4	
	VCR2/DVD-R	HIGH	B5	
	AUX1	HIGH	B6	
	AUX2	HIGH	B7	
	DVD-R (Not useable in this Model)	—	B8	
	CD	HIGH	B9	
	TAPE	HIGH	BA	
	CD-R	HIGH	BB	
	FM	HIGH	BC	
	AM	HIGH	BD	
	MW (Same as AM)	HIGH	BE	
	LW	HIGH	BF	
MULTI CHANNEL	TUNER	HIGH	BG	
	M-ch. INPUT ON	HIGH	BH	
	M-ch. INPUT OFF	HIGH	BI	
INPUT SIGNAL	A_D	HIGH	BJ	
TUNNER FREQ	AUTO-TUNE	HIGH	C0	
	FREQ UP	HIGH	C1	
	FREQ DOWN	HIGH	C2	

TABLE 1-continued

Normal Command List		(Sample Command ID = 1)		
Command	Priority	Character	Sample	
TUNNER PRESET	PRISSET INFO	LOW	C3	
	P-SCAN	LOW	C4	
	PRESET UP	HIGH	C5	
	PRESET DOWN	HIGH	C6	
F-DIRECT	F-DIRECT	LOW	C7	
TUNER MODE	T-MODE	LOW	C8	
MEMO/CLR	CLR	LOW	D0	
	MEMO	LOW	D1	
DIRECT KEY	DIRECT KEY 0	LOW	E0	
(10 Key)	DIRECT KEY 1	LOW	E1	
	DIRECT KEY 2	LOW	E2	
	DIRECT KEY 3	LOW	E3	
	DIRECT KEY 4	LOW	E4	
	DIRECT KEY 5	LOW	E5	
	DIRECT KEY 6	LOW	E6	
	DIRECT KEY 7	LOW	E7	
	DIRECT KEY 8	LOW	E8	
	DIRECT KEY 9	LOW	E9	

[0066]

TABLE 2

Command	Priority	Character	Sample
SURROUND	AUTO	HIGH	F0
MODE	THX 5.1MUSIC	HIGH	F1
	THX SURR EX	HIGH	F2
	THX CINEMA	HIGH	F3
	DTS	HIGH	F4
	DTS ES	HIGH	F5
	DOLBY	HIGH	F6
	DOLBY PROLOGIC	HIGH	F7
	DOLBY PRO LOGIC II MOVIE	HIGH	F8
	DOLBY PRO LOGIC II MUSIC	HIGH	F9
	VIRTUAL	HIGH	FA
	S DIRECT	HIGH	FB
	MOVIE	HIGH	FC
	HALL	HIGH	FD
	MATRIX	HIGH	FE
	Mch-STEREO	HIGH	FF
	STEREO	HIGH	FG
	MONO	—	FH
	NEO6 CINEMA	HIGH	FI
	NEO6 MUSIC	HIGH	FJ
	THX Adv EX	HIGH	FK
	CS5.1 MUSIC	HIGH	FL
	C55.1 CINEMA	HIGH	FM
	SURR MODE	HIGH	FN
VOLUME	VOLUME UP(SLOW)	HIGH	G0
	VOLUME DOWN(SLOW)	HIGH	G1
	VOLUME UP(FAST)	HIGH	G2
	VOLUME DOWN(FAST)	HIGH	G3
TONE	BASS UP	HIGH	G0
	BASS DOWN	HIGH	G1
	TREBLE UP	HIGH	G2
	TREBLE DOWN	HIGH	G3
SLEEP MODE	SLEEP	HIGH	H0
MUTE	MUTE OFF	LOW	H1
	MUTE ON	LOW	H2
VIDEO MUTE	VIDEO MUTE	LOW	H3
ATT	ATT	LOW	H4
TEST TONE	TEST TONE	LOW	I0
NIGHT	NIGHT ON/OFF	LOW	J0

[0067]

TABLE 3

Command	Priority	Character	Sample
DISPLAY OFF	DISP	LOW	J1
OSD	OSD	LOW	J2
MENU	MENU (OK)	HIGH	J3
	MENU OFF	HIGH	J4
CURSOL	CURSOL UP	HIGH	J5
	CURSOL DOWN	HIGH	J6
	CURSOL LEFT	HIGH	J7
	CURSOL RIGHT	HIGH	J8
RDS	RDS DISP MODE	LOW	J9
	RDS PTY	LOW	JA
VR VAL RESET	V RESET	LOW	JB
RE-EQ	RE-EQ	LOW	JC
CH SELECT	CH SEL	LOW	JD
CH LEVEL	CH LEVEL UP	LOW	JE
	CH LEVEL DOWN	LOW	JF
SELECT	SELECT	LOW	JG
ENTER	ENTER	LOW	JH
UP/DOWN	UP>>	LOW	JI
	DOWN<<	LOW	JK

[0068]

TABLE 4

Special Command List				
	Command	Priority	Character	Sample
MULTI	MULTI ROOM OFF	LOW	L0	"@1L0",0x0D
	MULTI ROOM ON	LOW	L1	
MUTE (MULTI)	MULTI ROOM MUTE	LOW	L2	
VOLUME (MULTI)	MULTI VOLUME UP(SLOW)	LOW	M0	
	MULTI VOLUME DOWN(SLOW)	LOW	M1	
	MULTI VOLUME UP(FAST)	LOW	M2	
	MULTI VOLUME DOWN(FAST)	LOW	M3	
SLEEP MODE (MULTI)	MULTI SLEEP	—	N0	
MULTI SPEAKER	MULTI SPEAKER ON	LOW	N1	
	MULTI SPEAKER OFF	LOW	N2	
MULTI INPUT	MULTI INPUT ON	LOW	N3	
	MULTI INPUT OFF	LOW	N4	

[0069]

TABLE 5

Command	Priority	Character	Sample
CONNECTION	ON	HIGH	P0
	OFF	HIGH	P1

[0070]

TABLE 6

Request Status Command (Status Command) List			
Request Status	Request Command	Answer	Character
Power Status	"@1?A",0x0D	Power ON	A0 ("@1A0",0x0D)
		Power OFF	A1
		NON	A-

TABLE 6-continued

Request Status Command (Status Command) List			
Request Status	Request Command	Answer	Character
Video IN	"@1?B",0x0D	DSS	B0
		TV	B1
		LD	B2
		DVD	B3
		VCR-1	B4
		VCR-2	B5
		AUX1	B6
		DVD-R	B7
		NON	B-
Audio IN	"@1?C",0x0D	DSS	C0
		TV	C1
		LD	C2
		DVD	C3
		VCR-1	C4
		VCR-2/DVD-R	C5
		AUX1	C6
		AUX2	C7
		DVD-R (Not usable)	C8
		CD	C9
		TAPE	CA

TABLE 6-continued

Request Status Command (Status Command) List			
Request Status	Request Command	Answer	Character
		CD-R	CB
		FM	CC
		AM	CD
		MW	CE
		LW	CF
		Mch INPUT	CG
		TUNER	CH
		NON	C-
Input Mode	"@1?D",0x0D	DIGIAL	D0
		ANALOGUE	D1
		NON	D-
Tuner Frequency	"@1?E",0x0D	XXXX (76.0~108.0)FM (153~1602)AM	E0XXXX
		NON	E-
Tuner	"@1?F",0x0D	PXX(Preset1~50)	F0XX

TABLE 6-continued

Request Status Command (Status Command) List			
Request Status	Request Command	Answer	Character
Preset		NON	F-
Tuner mode	"@1?G",0x0D	AUTO STEREO	G0
		MONO	G1
		NON	G-
VOLUME Status	"@1?H",0x0D	VOL XXXdB(-90~+99)	H0XXX
		max	H1
		min ( $\infty$ )	H2
		NON	H-
Bass Status	"@1?I",0x0D	BASSXXdB(-9~+9)	I0XX
		NON	I-
Treble	"@1?J",0x0D	TREBLEXXdB(-9~+9)	J0XX

TABLE 6-continued

Request Status Command (Status Command) List			
Request Status	Request Command	Answer	Character
Status		NON	J-
ATT	"@1?K",0x0D	ATT ON	K0
		ATT OFF	K1
		NON	K-

[0071]

TABLE 7

Request Status	Request Command	Answer Sample
SURROUND MODE	"@1?L",0x0D	AUTO
		L0 ("@1L0",0x0D)
		THX 5.1
		L1
		THX SURR EX
		L2
		THX CINEMA
		L3
		THX MUSIC
		L4
		DTS MUSIC
		L5
		DTS CINEMA
		L6
		DTS ES
		L7
		NEO 6
		L8
		NEO 6 MUSIC
		L9
		D DIGITAL
		LA
		DD PRO LOGIC
		LB
		DD PRO LOGIC II MOVIE
		LC
		DD PRO LOGIC II MUSIC
		LD
		CS CINEMA
		LE
		CS MUSIC
		LF
		VIRTUAL
		LG
		S DIRECT
		LH
		MOVIE
		LI
		HALL
		LJ
		MATRIX
		LK
		Mch-STEREO
		LL
		STEREO
		LM
		MONO
		LN
		L-
SLEEP Status	"@1?M",0x0D	SLEEP OFF
		M0
		SLEEP XXX(1~120)
DISP Status	"@1?N",0x0D	NON
		M1XXX
		M-
DISP Status	"@1?N",0x0D	DISPLAY ON
		N0
		DISPLAY OFF
OSD Status	"@1?O",0x0D	NON
		N1
		N-
OSD Status	"@1?O",0x0D	OSD ON
		O0
		OSD OFF
TEST TONE	"@1?P",0x0D	NON
		O1
		O-
TEST TONE	"@1?P",0x0D	TEST TONE L
		P1
		TEST TONE C
TEST TONE	"@1?P",0x0D	P2
		TEST TONE R
		P3
TEST TONE	"@1?P",0x0D	TEST TONE SR
		P4
		TEST TONE SBR
TEST TONE	"@1?P",0x0D	P5
		TEST TONE SBL
		P6
TEST TONE	"@1?P",0x0D	TEST TONE SL
		P7
		TEST TONE SW
TEST TONE	"@1?P",0x0D	P8
		TEST TONE ALL
		P9
TEST TONE	"@1?P",0x0D	TEST TONE OFF
		P0
		NON
TEST TONE	"@1?Q",0x0D	P-
		TEST TONE AUTO
		Q0
TEST TONE	"@1?Q",0x0D	TEST TONE MANUAL
		Q1
		NON
NIGHT MODE	"@1?R",0x0D	Q-
		NIGHT MODE ON
		R0
NIGHT MODE	"@1?R",0x0D	NIGHT MODE OFF
		R1
		NON
		R-

TABLE 7-continued

Request Status	Request Command	Answer Sample	
MENU	"@1?S",0x0D	MENU ON	S0
		MENU OFF	S1
		NON	S-

[0072]

TABLE 8

Request Status	Request Command	Answer Sample	
F-DIRECT	"@1?T",0x0D	F-DIRECT ON	T0
		F-DIRECT OFF	T1
		NON	T-
P-FORMAT	"@1?U",0x0D	D DIGITAL(AC-3)	U0
		DD SURROUND	U1
		DD SURR EX	U2
		DTS	U3
		DTS ES	U4
		AAC	U5
		MPEG	U6
		MLP	U7
		PCM	U8
		HDCD	U9
		DSD	UA
		OTHER	UB
		NON_DETECTION	UC
		NON	U-
		32K	V0
SAMPLING FREQ FS	"@1?V",0x0D	44.1K	V1
		48K	V2
		88.2K	V3
		96K	V4
		176.4K	V5
		192K	V6
		OUT OF RANGE	V7
		NON	V-
□Channel Status	"@1?W",0x0D	XX(Bit 6-01: on 0: off)	WXX
		NON	W-

TABLE 10-continued

Request Status	Request Command	Answer Sample	
Video IN(MR)	"@1?Y",0x0D	DSS	Y0
		TV	Y1
		LD	Y2
		DVD	Y3
		VCR1	Y4
		VCR2/DVD-R	Y5
		AUX1	Y6
Audio IN(MR)	"@1?Z",0x0D	DVD-R	Y7
		NON	Y-
		DSS	Z0
		TV	Z1
		LD	Z2
		DVD	Z3
		VCR1	Z4
		VCR2/DVD-R)	Z5
		AUX1	Z6
		AUX2	Z7
		CD	Z9
		TAPE	ZA
		CD-R	ZB
		MD	ZC
		FM	ZD
Tuner Frequency (MR)	"@1?a",0x0D	AM	ZE
		MW	ZF
		LW	ZG
		TUNER	ZH
		NON	Z-
		XXXXX(76.0~108.0)	a0XXXX
		FM (153~1602) AM	

[0073]

TABLE 9

"ON/OFF" information is indicated "Bit" by 'Bit'.												
Bit	7	6	5	4	3	2	1	0				
	1	LFE	S	S	S	L	R	C	L	C	R	
7:	NOT USED	1	1									
6:	LFE	1	0									
5:	SL	1	0						LFE			
4:	SR	1	0									
3:	S	1	0									
2:	L	1	0									
1:	R	1	0						SL	S	S	
0:	C	1	0									

[0074]

TABLE 10

Request Status	Request Command	Answer Sample	
Multi Room Status	"@1X?",0x0D	Power ON	X0
		OFF	X1
		NON	X-

TABLE 10-continued

Request Status	Request Command	Answer Sample	
Tuner Preset (MR)	"@1?b",0x0D	NON	a-
		PXX(Preset1~50,255)	b0XX
VOLUME Status(MR)	"@1?c",0x0D	NON	b-
		VOL XXX(-90~+99)	c0XXX

TABLE 10-continued

Request Status	Request Command	Answer Sample
Volume Set Status (MR)	"@1?d",0x0D	max
		min ( $\infty$ )
		NON
		Variable
SLEEP Status(MR)	"@1?e",0x0D	Fixed
		NON
		SLEEP OFF
		SLEEP XXX(1~120)
MULTI OSD	"@1?f",0x0D	e0
		e1XXX
		NON
		MULTI OSD ON
MULTI SPEAKER	"@1?g",0x0D	f0
		MULTI OSD OFF
		f1
		NON
MUTE (MR)	"@1?h",0x0D	f-
		MULTI SPEAKER ON
		MULTI SPEAKER OFF
		g0
		g1
		NON
		MUTE ON (MR)
		MUTE OFF (MR)
		h0
		h1
		h-
		NON

**[0075]** 4. Conclusion

**[0076]** While certain features of the invention have been illustrated and described herein, many modifications, substitutions, changes and equivalents will now occur to those skilled in the art. It is, therefore, to be understood that the appended claims are intended to cover all such modifications and changes as fall within the true spirit of the invention.

What is claimed is:

1. An apparatus for controlling a media receiver, the apparatus comprising:

a media player interface comprising a plurality of receiver connections, each operable to communicate with the media receiver;

a media database comprising a plurality of media unit records each identifying one of a plurality of media units by one or more characteristics, wherein a first characteristic of each media unit record identifies one media type of a plurality of media types;

a play selection system to (i) retrieve a media unit record from the media database for a selected media unit, (ii) determine a media type of the selected media unit from the media unit record, and (iii) communicate, to a media play processor, a receiver connection selection for the selected media unit based on the media type of the selected media unit; and

the media play processor to (i) configure the media receiver, and (ii) couple the selected media unit to a selected receiver connection, according to the receiver connection selection.

2. The apparatus of claim 1, further comprising:

a play mode record stored in the media database,

wherein the play selection system (i) retrieves the play mode record for the selected media unit from the media database, (ii) determines a play mode selection for the selected media unit based on at least one of the one or more characteristics and the play mode record, and (iii) communicates the play mode selection to the media play processor,

wherein the media play processor requests the media receiver to play the selected media unit according to the play mode selection.

3. The apparatus of claim 2, wherein the at least one of the one or more characteristics is a characteristic selected from the group consisting of: title, song, genre, location, label, artist, media type, and date.

4. The apparatus of claim 2, wherein the play mode selection is for a play mode selected from the group consisting of: rock arena, jazz club, classic concert, mono movie, matrix, 5-channel stereo, 7-channel stereo, stereo, pure direct, direct, super stadium, wide screen, cinema, Dolby Digital, Dolby Pro Logic, Digital Theater System, and THX.

5. The apparatus of claim 2, wherein the play mode selection defines one or more media receiver settings selected from the group of consisting of: tone settings, equalization settings, noise reduction settings, level adjustment settings, balance settings, and delay time settings, and bass settings.

6. The apparatus of claim 2, further comprising:

a user interface for providing a configuration process for querying a user to choose the play mode selection to be requested by the media play processor when a characteristic of the selected media unit matches the at least one of the one or more characteristics,

wherein the at least one of the one or more characteristics is a characteristic selected from the group consisting of: title, song, genre, location, label, artist, media type, and date.

7. The apparatus of claim 1, further comprising:

a user interface for providing a configuration process for querying a user to select a respective receiver connection for each of the plurality of media types.

8. The apparatus of claim 1, wherein the media type of the selected media unit is a media type selected from the group consisting of: motion picture experts group—audio layer 3 (MP3), compact disc (CD), digital versatile disc audio (DVD-audio), DVD-movie, super audio CD (SACD), pulse code modulation (PCM), free lossless audio codec (FLAC), advanced audio coding (AAC), and waveform audio format (WAV).

9. The apparatus of claim 1, further comprising:

a media receiver type record stored in the media database, wherein the media receiver type record identifies the media receiver, and wherein the receiver connection selection is further based on the media receiver type record.

10. The apparatus of claim 1, further comprising:

a media type configuration record stored in the media database, wherein the play selection system retrieves the media type configuration record to determine the receiver connection selection.

11. The apparatus of claim 1, wherein the media type of the selected media unit consists of a type selected from the group consisting of: compressed media, uncompressed media, and a combination of compressed and uncompressed media.

12. The apparatus of claim 1, wherein the media type of the selected media unit consists of a type selected from the group consisting of encrypted media and unencrypted media.

13. The apparatus of claim 1, wherein the selected receiver connections are connections selected from the group consisting of: digital connections and analog connections.

14. The apparatus of claim 1, further comprising:

a user interface for choosing the selected media unit.

15. An apparatus for controlling a media receiver, the apparatus comprising:

a media player interface comprising a plurality of receiver connections, each operable to communicate with the media receiver;

a media database comprising (i) a play mode record, and (ii) a plurality of media unit records each identifying one of a plurality of media units by one or more characteristics,

wherein a first characteristic of each media unit record identifies a characteristic selected from the group consisting of: title, song, genre, location, label, artist, media type, and date, and

wherein the play mode record identifies one of a plurality of play modes corresponding to the first characteristic;

a play selection system to (i) retrieve the play mode record from the media database, (ii) retrieve a media unit record from the media database for a selected media unit, (iii) determine the first characteristic of the selected media unit from the media unit record, and (iii) communicate, to a media play processor, a play mode selection for the selected media unit based on at least the first characteristic and the play mode record; and

the media play processor to request the media receiver to play the selected media unit according to the play mode selection.

16. The apparatus of claim 15, further comprising:

wherein the media unit record further identifies a media type of the selected media unit,

wherein the play selection system further (i) retrieves a media type configuration record stored in the media database, (ii) determines the media type of the selected media unit from the media unit record, (iii) determines a receiver connection selection based on the media type and the media type configuration record, and (iv) communicates, to the media play processor, the receiver connection selection, and

wherein the media play processor (i) requests the media receiver to use a media receiver connection corresponding to the receiver connection selection, and (ii) couples the selected media unit to one of the plurality of receiver connections according to the receiver connection selection.

17. The apparatus of claim 16, wherein the media receiver connection corresponding to the receiver connection selection comprises a connection selected from the group consisting of a digital connection, and an analog connection.

18. The apparatus of claim 16, further comprising:

a media receiver type record stored in the media database, wherein the media receiver type record identifies the media receiver, and wherein the receiver connection selection is further based on the media receiver type record.

19. A method for controlling a receiver, the method comprising:

retrieving a media unit record for a media unit selected to be played by a receiver coupled to a media player interface, wherein the media unit record identifies a media type for the media unit;

retrieving a media type configuration record, wherein the media type configuration record identifies one of a plurality of receiver connections corresponding to the media type; and

requesting the receiver to use the one of a plurality of receiver connections to receive the media unit for play by the receiver.

20. The method of claim 19, further comprising:

retrieving a play mode record, wherein the play mode record identifies one of a plurality of play modes corresponding to one of a plurality of characteristics identified in the media unit record, and

requesting the receiver to play the media unit according to the one of a plurality of play modes.

21. The method of claim 20, further comprising:

querying a user to select one of the plurality of play modes to correspond to one of the plurality of characteristics.

22. The method of claim 21, further comprising:

continuing to query the user to select the play modes until each of the plurality of characteristics available corresponds to a selected play mode.

23. The method of claim 22, further comprising:

displaying the query on a display terminal; and

storing the selected play modes corresponding to the plurality of characteristics in the play mode record.

24. The method of claim 20, wherein the one of a plurality of play modes is a mode selected from the group consisting of: rock arena, jazz club, classic concert, mono movie, matrix, 5-channel stereo, 7-channel stereo, stereo, pure direct, direct, super stadium, wide screen, cinema, Dolby Digital, Dolby Pro Logic, Digital Theater System, and THX.

25. The method of claim 20, wherein each of the plurality of play modes defines one or more receiver settings selected from the group of consisting of: tone settings, equalization settings, noise reduction settings, level adjustment settings, balance settings, and delay time settings, and bass settings.

26. The method of claim 19, further comprising:

querying a user to select one of the plurality of receiver connections to correspond to one of a plurality of media types,

wherein the plurality of media types includes the media type for the media unit.

27. The method of claim 26, further comprising:

continuing to query the user to select the receiver connections until each media type of the plurality of media types corresponds to a selected receiver connection.

28. The method of claim 27, further comprising:

displaying the query on a display terminal; and

storing the selected receiver connections corresponding to the media types in the media type configuration record.

29. The method of claim 19, wherein the retrieving a media unit record step occurs in response to loading a disc into a disc player.

30. The method of claim 19, wherein the retrieving a media unit record step occurs in response to receiving a stream of data from a data storage device.

31. A media management system comprising:

- a plurality of media source input/output (I/O) ports coupled to a plurality of media sources;
- a user interface coupled to at least one user interface device, the user interface operable to receive at least one media play instruction from a user;
- a media player interface comprising a plurality of receiver connections, each communicatively coupled to a media receiver;
- a media database comprising (i) a plurality of media unit records, (ii) a media type configuration record, (iii) a play mode record, and (iv) a media receiver type record that identifies the media receiver, wherein each of the media unit records identifies (a) one of a plurality of media units by a characteristic that corresponds to one

of a plurality of play modes identified in the play mode record, and (b) a media type that corresponds to one of a plurality of receiver connections identified in the media type configuration record;

- a play selection system for (i) retrieving a media unit record for a selected media unit to be played by the media receiver, the media type configuration record, the play mode record, and the media receiver type record, (ii) determining a play mode for the selected media unit from the media unit record and the play mode record, (iii) determining a receiver connection selection based on the media type, the media type configuration record, and the media receiver type record, and (iv) communicating, to a media player processor, the receiver connection selection and the play mode for the selected media unit; and

the media play processor to (i) configure the media receiver, and (ii) couple the selected media unit to a selected receiver connection, according to the receiver connection selection.

\* \* \* \* \*